

**Summary Minutes of the
U.S. Environmental Protection Agency (EPA)
Clean Air Scientific Advisory Committee
Air Monitoring and Methods Subcommittee (AMMS) Review of EPA's Draft Near-Road
Technical Assistance Document
Public Teleconference**

Date and Time: Thursday, September 29, 2011, 11:30 A.M. – 4:00 P.M. ET

Location: Teleconference Only

Purpose: The purpose of the September 29, 2011 teleconference call was for the EPA Clean Air Scientific Advisory Committee Air Monitoring and Methods Subcommittee (AMMS) to review and provide advice and ideas on how to improve EPA's Near-Road NO₂ Monitoring Technical Assistance Document (TAD).

Participants:

AMMS: CASAC Air Monitoring and Methods Subcommittee (See Roster, Attachment A):

Dr. Armistead (Ted) Russell, Chair
Dr. David T. Allen
Mr. George A. Allen
Dr. Linda Bonanno
Dr. Doug Burns
Dr. Judith Chow
Dr. Kenneth Demerjian
Mr. Eric Edgerton
Mr. Henry (Dirk) Felton
Dr. Philip Fine
Dr. Philip Hopke
Dr. Rudolf Husar
Dr. Daniel Jacob
Dr. Peter H. McMurry
Dr. Allen Robinson
Dr. James Jay Schauer
Dr. Jay Turner
Dr. Yousheng Zeng

Dr. Philip Fine could not participate during the September 29, 2011 teleconference call.

EPA SAB Staff: Mr. Edward Hanlon, Designated Federal Officer

EPA Staff: Mr. Nealson Watkins, EPA Office of Air Quality Planning
and Standards

Other Participants: Mr. Rich Baldauf, EPA Office of Air Quality Planning
and Standards

Other Attendees: A list of members of the public who participated or requested information for calling into the teleconference is provided in Attachment B, Public Attendance.

Materials Available: The agenda and teleconference materials were circulated to the AMMS in advance of the teleconference, and were made available to the public via the CASAC website (www.epa.gov/casac) on the following CASAC AMMS Near-Road September 29, 2011 teleconference webpage:

<http://yosemite.epa.gov/sab/sabproduct.nsf/bf498bd32a1c7fdf85257242006dd6cb/07f0cde2113f6c26852578f5006a7581!OpenDocument&Date=2011-09-29>

Teleconference Summary

The teleconference was announced in the Federal Register¹ and proceeded according to the teleconference agenda². A summary of the teleconference follows.

September 29, 2011

Opening Statements and Welcome

Mr. Ed Hanlon, the Designated Federal Officer (DFO), opened the teleconference, and made a brief opening statement noting that the AMMS is a Federal Advisory Committee under the Federal Advisory Committee Act (FACA). He noted the teleconference was open to the public and that Agency-provided briefing materials were posted onto the teleconference websites. He stated that no written public comments were received for the Panel's consideration for this review, and also that no members of the public requested to present oral comments during the teleconference. He noted that the SAB Staff Office has determined there are no conflict-of-interest or appearance of a lack of impartiality issues for any of the AMMS advisory committee members for this review. Mr. Hanlon also noted that minutes were being taken to summarize discussions and action items in accordance with requirements under FACA. He then turned the teleconference call over to the Chair, Dr. Ted Russell.

Dr. Russell welcomed everyone and noted that this is an Advisory effort where a report seeking consensus would be prepared. He stated that lead discussants would summarize the responses to each charge question, and that the final CASAC letter and report will include the consensus position of the Panel and separate individual comments associated with this review. Dr. Russell further noted that preliminary Panel member comments were provided on the teleconference website, and that the preliminary comments were intended to serve as 'discussion starters'. He also noted that a previous CASAC panel reviewed an earlier phase of EPA's Near-Road project, and that in November 2010, a final report was issued for the CASAC Review of the "Near-road Guidance Document – Outline" and "Near-road Monitoring Pilot Study Objectives and Approach". He stated that EPA considered those recommendations from CASAC and drafted the TAD as the next phase of this project for CASAC review. Dr. Russell reviewed the agenda, and then requested that EPA commence with their presentation.

EPA Presentation

Mr. Rich Baldauf, EPA Office of Air Quality Planning and Standards, made a brief opening statement and presented and discussed his PowerPoint slides³ that were provided on the teleconference website. He noted that Near-Road monitoring represents the relative worst-case locations for NO₂ levels, and stated that the TAD is meant to convey information to allow States to follow the intent of EPA's NO₂ regulation. He commented that the TAD was meant to be streamlined, and that relatively few references were included to provide clarification and more detailed information if desired. He also stated that EPA relied primarily on EPA publications in drafting the TAD and included references to EPA website to prevent copyright issues.

Several Panel members discussed whether EPA intended to apply exposures to vehicle passengers who are traveling on the road as part of the Near-Road project, and whether the TAD should explicitly state that Near-Road monitoring requirements are not meant to apply to such exposures. Mr. Baldauf responded that he was not in a position to represent EPA's policy on this issue. He noted that while in-vehicle was not a direct exposure, on-road exposure was a direct exposure. Several Panel members commented that the TAD should specify objectives for Near-Road monitoring.

Discussion of Charge Questions

Dr. Russell requested that discussion commence on the AMMS responses to charge questions. He requested that lead discussants on the AMMS Panel summarize key points and consensus points after discussions occurred on each charge question.

Charge Question 1 – Objectives and Rationale for the Draft TAD

The Panel discussed whether EPA intended to apply exposures to vehicle passengers who are traveling on the road as part of the Near-Road project, and whether the TAD should explicitly state that Near-Road monitoring requirements are not meant to apply to such exposures. The Panel agreed that the TAD should be more specific on the objectives for the Near-Road Network. The Panel also stated that primary vs. secondary objectives should be discussed, and suggested that EPA include the actual CFR language on this topic. The Panel also suggested that EPA combine discussion from Chapters 1 and 2, and explain exposures that occur on the road and near the road.

A Panel member suggested that the TAD state what it is not addressing (e.g., data management and quality control). Another Panel member stated that the TAD only identified primary objectives listed for the Near-Road Network, and should also note secondary objectives if any. Several Panel members suggested that the TAD discuss how Near-Road Network data compared with each other, and what EPA will do with the data once it is gathered.

A Panel member noted that the TAD should discuss whether peak concentrations should be gathered at roadsides, and discuss what kinds of exposures are being considered for the Near-Road Network. Another Panel member suggested that the TAD discuss requirements for Near-Road monitor site selection, including whether and how monitoring and modeling information would assist in site selection. One Panel member commented that since the majority of Near-Road exposure occurs to people traveling in vehicles, EPA should regulate maximum concentrations in an area in consideration of exposure. Another Panel member expressed concern that there were high uncertainties in assessing exposure to on-road commuters.

In response to questions on objectives, Mr. Nealsen Watkins noted that Near-Road monitoring was intended to address the lack of data for the Near-Road environment. He commented that Near-Road monitoring was seeking maximum NO₂ concentrations near roads. He stated that EPA considered population exposure after considering the six factors (annual average daily traffic (AADT), fleet mix, congestion patterns, roadway design, terrain, and meteorology). He also stated that exposures to in-car and in residences were part of the population that EPA considered. Mr. Watkins also responded that EPA understands there are high uncertainties in assessing exposure to on-road commuters, and could not assess every vehicle type as the assessment moves forward.

Mr. Watkins noted that EPA's Risk and Exposure Assessment (REA) includes in-vehicle exposures to NO₂. He commented that EPA cannot measure 'on the road' because that is infeasible. He noted that EPA could possibly put a monitor in an island between sides of the road, but noted that is not a typical approach. Mr. Watkins commented that EPA's regulations state that monitors should be placed as close as possible to the road as possible.

One Panel member noted that roadways should be monitored and the TAD should discuss other ways to monitor near-road environments. Mr. Watkins responded that the State of Maryland conducted measurements on five roadways in Baltimore near a harbor tunnel. The toll plaza was indicated to be a hot spot while the other measurements may be more representative for other urban areas.

Charge Question 2 – Near-Road NO₂ Site Selection Process

The Panel discussed whether the suggested approach in the TAD places an appropriate amount of weight and consideration on all six factors required to be considered (AADT, fleet mix, congestion patterns, roadway design, terrain, and meteorology) as part of the near-road NO₂ site selection process, and generally believed that the TAD placed too much emphasis on AADT. The Panel also noted that the TAD should better describe the placement of monitors between 0 and 50 meters from the road, include traffic count data, and have flexibility to consider hot spots.

One Panel member stated that the TAD should highlight where and how to choose background and ambient concentrations. Several Panel members noted that the TAD placed too much emphasis on annual average traffic, and commented that the most important factor to consider in locating monitoring sites was human exposure. The member also noted that Near-Road monitoring was restricted to roads with over 250,000 cars/day, and commented that this was too restrictive since this essentially limited monitoring to only superhighways. The member commented that a bus stop in New York City does not have 250,000 cars/day, but has very high readings and is not meeting any of EPA's criteria.

A few Panel members commented that more study was needed to assess effects of road design, road structure and barriers on pollutant levels near roadways. Several Panel members noted that hourly traffic data should be used to assess Near-Road impacts. A Panel member noted that EPA should consider the distance to the nearest background sites when determining Near-Road monitor locations. Another Panel member commented that EPA should be looking out ten years from now to assess potential issues, noting that Near-Road NO_x levels will plummet as new regulatory requirements come in.

Several members commented that the TAD should discuss how to assess cumulative effects,

noting it is unclear how to assess ranking and ambient concentrations in situations where two or three parallel roads are nearby each other. Another member commented that the TAD should discuss how to consider nearby stationary NO₂ or NO_x sources.

Charge Question 3 - Fleet Equivalent Annual Average Daily Traffic Metric

The Panel discussed the usefulness of the Fleet Equivalent AADT metric, and noted that even though it is a reasonable first step in triaging monitoring, there is some concern that this technique would capture various parameters. The Panel also expressed concern on the use of national averages in various regions of the country, and noted that the TAD should quantify effects from traffic congestion.

A Panel member commented that EPA should tabular information on studies from different cities in the TAD to show the numbers associated with accuracy of the emissions. The Panel discussed whether the TAD should consider human exposure in assessing the usefulness of AADT. Several Panel members commented that the TAD should such exposure, and suggested that the TAD consider intersections of higher populations and roadways exceeding a particular number.

One Panel member noted that if the purpose of Near-Road monitoring is to assess compliance with attainment with regulatory requirements, EPA did not have flexibility to pick sites with higher impact to residents because of how the Clean Air Act (CAA) is structured. The Panel discussed this issue, and generally agreed that since the National Ambient Air Quality Standards (NAAQS) is based on human health protection, exposure to humans should be part of the TAD objectives.

Question 4 – Roadway Pollutant Dispersion

The Panel discussed and generally believed that the TAD adequately described the effects of roadway design, roadway structures, terrain, and meteorology on roadway pollutant dispersion and suggested how those effects can be considered in the near-road site selection process. The Panel noted the TAD should discuss hot spots, mature vegetation effects, and effects associated with proximity to waterbodies. The Panel also recommended that the TAD's Figure 6.2 refers to large particle sizes does not indicate how gas behaves conservatively.

One Panel member commented that mature vegetation can create a barrier and that the TAD should clarify that such vegetative areas should be avoided when selecting monitoring locations. Another member commented that EPA should consider choosing a road segment perpendicular to the roadway location to assess background concentrations.

Several Panel members commented that road interchanges may cause high levels since congestion can be high, and noted that the TAD should consider whether monitors should be preferentially placed near such interchanges and toll booths.

Charge Question 5 – Siting Requirements and Monitoring Probes

The Panel discussed and generally believed that the TAD would benefit if it provided guidance on how to assess modeling results on distance to roads and obstacles when siting monitoring probes. The Panel also believed the TAD should provide detail on where not to site probes.

One Panel member stated that proper placement of site monitors should consider data indicating

the magnitude of effects associated with monitors located at different heights and distances from the roadway. The Panel member noted that monitors placed a few tens of centimeters off the ground near roadways monitor car emissions, and that heavy diesel trucks have releases at 3 meters. The Panel member also noted that roadway devices may need a measurement shelter and possibly a tower, and that good residence time should be provided in the equipment.

One Panel member suggested that EPA gather data collected near roadway sites in other countries, and provide information on such data. Another Panel member asked EPA to clarify in the TAD whether monitors may be appropriately placed next to a tunnel.

Charge Question 6 – Exploratory Monitoring in the Near-Road Site Selection Process

The Panel discussed and generally agreed that the TAD adequately discussed and explained the varied approaches on the optional use of exploratory monitoring as part of the near-road site selection process. The Panel stated that to utilize data, models were needed to interpret and interlink Sections 8 and 9 of the TAD, and to help on siting locations.

One Panel member stated that while the TAD did not give much detail on exploratory monitoring options, it provided a fairly reasonable approach on which to proceed. Another Panel member suggested that EPA should provide guidance and/or a model with accompanying model guidance on how to select which approaches should be performed.

Several Panel members commented that the TAD should discuss how to overrule data and modeling results. The Panel discussed variation in mobile instruments, and how to address this variability. Several Panel members noted that EPA is currently gathering pilot study data on mobile monitors, and that such data should be used to assist states in developing a deployable system.

Charge Question 7 – Use of AERMOD and MOVES Dispersion Modeling

The Panel discussed and generally agreed that the TAD should consider models other than AERMOD and MOVES to conduct dispersion modeling in the near-road site selection process. The Panel stated that that TAD should note that NO and NO₂ chemistry should be considered when conducting Near-Road dispersion modeling, and when assessing background NO₂ from multiple background sources.

A few Panel members recommended that EPA consider adding example AERMOD runs to the TAD, and describe interface tools that would be useful to consider. A Panel member requested that the TAD discuss how chemistry affects NO₂ modeling, and noted that background NO₂ and NO₂ emissions should be considered in the AERMOD model.

One Panel member commented that if one can use models to assess impacts at 20 or 50 meters, they could use models to assess exposures in different geographic areas. Another Panel member noted that AERMOD is a point source model, and the Near-Road modeling should be broader and allow other models to be considered for use, such as such as CALINE4, or AERLINE when it becomes available. One Panel member noted that the models that would be used for within the 50 meter distance should incorporate kinetics data. Another Panel member noted that EPA should consider the evolution of the NO and NO₂ ratio when assessing use of kinetics data. Another Panel member stated that aerosol kinetics indicate that sub-25 nanometer particles were very important, and the levels depend on driving characteristics and local temperature. The

Panel member noted that larger particles were less well understood.

Another Panel member commented that EPA should consider conducting a conformity analysis when assessing large non attainment areas when conducting Near-Road dispersion modeling. The Panel member also noted that emission data collected from metropolitan planning organizations should be considered.

Charge Question 8 – Characterization of Individual Candidate Road Sites

The Panel discussed and generally agreed that the list of items needed to appropriately characterize individual candidate road sites is generally comprehensive and adequately described. The Panel noted identified a few missing characteristics that should be included in the TAD, including the need for representative sites such as toll booths, other NO₂ sources, roadway grade information and other meteorological data. The Panel also commented that Section 10 of the TAD was mislabeled.

One Panel member commented that background NO_x and surrounding land use are important data to support Near-Road monitoring objectives. Another Panel member commented that existing traffic monitoring conditions is important, and that the monitoring agency should consider where the nearby NCore sites are to assess background measurements. Another Panel member noted that regarding representativeness, long and short roads, and toll booths, have different characteristics, and EPA should consider identifying different categories for sites.

Charge Question 9 - Transportation Agency Policies and Expectations

The Panel discussed and generally agreed that the TAD's definitions and explanation of transportation agency policies and expectations should be streamlined. The Panel agreed that the opening paragraph should discuss issues associated with collecting data within 20 meters of the roadway. The Panel also noted that U.S. Department of Transportation camera utility should be discussed within the TAD.

One Panel member commented that the discussion on safety was a critical aspect of the guidance on transportation agency expectations. The Panel member suggested that EPA add a bulleted list of factors to be considered. The Panel discussed the collection of data on the high single hour concentrations of pollutants, and generally believed there was utility in collecting this data.

Charge Question 10 - Site Comparison Matrix

The Panel discussed and generally agreed that the TAD's suggested site comparison matrix discussed within Section 13 was helpful. The Panel suggested adding columns to assess local intersections. The Panel noted that local knowledge is important in siting, and that backup locations should be developed for each monitoring site in case it needs to be changed quickly. The Panel also noted that one or two hour violations may occur during accidents.

One Panel member noted that there would be no reason to fill out the rest of the matrix if a site was already located by an agency. The Panel member commented that after installation at one location, after five or so years the agency would likely want to go to another site. The Panel member also noted that in urban areas, agencies can never predict bridge or road construction issues and thus having a backup location is important. Another Panel member noted that moving a location was very difficult. Mr. Watkins noted that EPA discourages moving the siting locations, and thus, agencies should have pre-approved site locations. He also noted that road

construction questions are noted in the TAD, and that state DOT's have short and long term construction cycles. A panel member noted that such planning information is usually available.

Several Panel members commented that understanding the urban area is vital for proper site selection. One Panel member suggested that the guidance provide information on how to identify the secondary sites. Dr. Russell noted that the cover letter should note that guidance on how to identify secondary sites was a key need.

Charge Question 11 - Pollutants and Metrics of Interest in the Near-Road Environment,

The Panel discussed the order of presentation of each pollutant or metric of interest in the near-road environment within Section 14 of the TAD, and whether a pollutant or other metric should be removed from the list within Section 14 or whether an unlisted item should be included within this section. During the discussion, several Panel members suggested either raising or lowering the priority for certain pollutants, and the merits of deleting a pollutant from the list or adding a new pollutant to the list. The Panel members also discussed of whether it was important to measure a pollutant for attainment decisions, and whether there were new or emerging instruments that would enable a pollutant to be adequately measured and reported.

After discussion, the Panel agreed on the following order of importance for each pollutant or metric of interest:

- NO₂
- CO
- Meteorological data
- Use of camera to gather data
- Ozone
- Air toxics
- Black carbon
- NO_x
- PM
- CO₂

The Panel agreed to delete SO₂ and lead from the list. The Panel noted that the priority or level of importance of pollutants on the list really depended on the objectives for the monitoring. The Panel agreed that it would be helpful to separate the level of importance of the list (i.e., develop a higher and lower priority for pollutants), and/or recommend that an agency develop two separate lists for different objectives (e.g., gathering data for research vs. regulatory purposes). The Panel also agreed to recommend that EPA provide flexibility to choose higher vs. lower priority pollutants. The Panel agreed to try to develop a response that indicated a recommended priority for pollutants for a stated objective.

A few Panel members also commented that information on analytical procedures and data quality control were important aspects that EPA should consider when developing the priority list and guidance.

Dr. Russell then noted that based on the discussion during the teleconference, he believed the CASAC cover letter should have three key points:

- 1) Objectives: The TAD should define primary and secondary objectives.
- 2) Decision points: The TAD should identify what would or would not be allowed in terms of monitoring site placement. What are the real limits on such selection.
- 3) Secondary Sites: The TAD should provide guidance on how to site the second monitoring site, and differentiate how siting considerations differ between the first and second sites.

The Panel generally agreed with these items, and also provided additional points to consider. One Panel member commented that EPA should clarify whether EPA methods must be used to analyze priority/criteria pollutants on the list. Another Panel member suggested that the TAD discuss how to relay measurements from roadside monitors in order to assess the monitoring information. The Panel agreed to consider adding these items into the individual responses to the charge questions.

Dr. Russell then discussed next steps and action items, and asked if the Panel members had any additional questions or comments. Hearing none, Dr. Russell thanked the Panel members and EPA staff who participated at the teleconference. With the meeting business concluded, the Designated Federal Officer adjourned the meeting at 4:00 pm ET.

Respectfully Submitted:

/signed/

Mr. Edward Hanlon
Designated Federal Officer

Certified as Accurate:

/signed/

Dr. Ted Russell, Chair
CASAC Air Monitoring and
Methods Subcommittee

NOTE AND DISCLAIMER: The minutes of this public teleconference reflect diverse ideas and suggestions offered by Panel members during the course of deliberations within the teleconferences. Such ideas, suggestions and deliberations do not necessarily reflect consensus advice from the Panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters or reports prepared and transmitted to the EPA Administrator following the public meetings or teleconferences.

Materials Cited

The following meeting materials are available on the CASAC website (www.epa.gov/casac) on or through the following CASAC AMMS Near-Road September 29, 2011 teleconference webpage:

<http://yosemite.epa.gov/sab/sabproduct.nsf/bf498bd32a1c7fdf85257242006dd6cb/07f0cde2113f6c26852578f5006a7581!OpenDocument&Date=2011-09-29>

¹ Federal Register Notice announcing the teleconference

² Agenda for September 29, 2011 public teleconference

³ Presentation from Mr. Nealson Watkins, USEPA

ATTACHMENT A – ROSTER

U.S. Environmental Protection Agency Clean Air Scientific Advisory Committee CASAC Air Monitoring and Methods Subcommittee (AMMS)

CHAIR

Dr. Armistead (Ted) Russell, Professor, Department of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA

MEMBERS OF AMMS

Dr. David T. Allen, Professor, Department of Chemical Engineering, University of Texas, Austin, TX

Mr. George A. Allen, Senior Scientist, Northeast States for Coordinated Air Use Management (NESCAUM), Boston, MA

Dr. Linda Bonanno, Research Scientist, Office of Science/Division of Air Quality, New Jersey Department of Environmental Protection, Trenton, NJ

Dr. Doug Burns, Research Hydrologist, U.S. Geological Survey

Dr. Judith Chow, Research Professor, Desert Research Institute, Air Resources Laboratory, University of Nevada, Reno, NV

Dr. Kenneth Demerjian, Professor and Director, Atmospheric Sciences Research Center, State University of New York, Albany, NY

Mr. Eric Edgerton, President, Atmospheric Research & Analysis, Inc., Cary, NC

Mr. Henry (Dirk) Felton, Research Scientist, Division of Air Resources, Bureau of Air Quality Surveillance, New York State Department of Environmental Conservation, Albany, NY

Dr. Philip Fine, Atmospheric Measurements Manager, South Coast Air Quality Management District, Diamond Bar, CA

Dr. Philip Hopke, Bayard D. Clarkson Distinguished Professor, Department of Chemical and Biomolecular Engineering, Clarkson University, Potsdam, NY

Dr. Rudolf Husar, Professor, Mechanical Engineering, Engineering and Applied Science, Washington University, St. Louis, MO

Dr. Daniel Jacob, Professor, Atmospheric Sciences, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA

Dr. Peter H. McMurtry, Professor, Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN

Dr. Allen Robinson, Professor, Department of Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, PA

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Dr. Yousheng Zeng, Managing Partner, Providence Engineering & Environmental Group LLC, Baton Rouge, LA

SCIENCE ADVISORY BOARD STAFF

Mr. Edward Hanlon, Designated Federal Officer, U.S. Environmental Protection Agency, Washington, DC

ATTACHMENT B – Other Attendees

List of Members of the Public Who Requested Information for Calling into the Public Teleconferences of the EPA Clean Air Scientific Advisory Committee Air Monitoring and Methods Subcommittee (AMMS) for the Review of EPA’s Draft Near-Road Technical Assistance Document

September 29, 2011

Name	Affiliation
Aldredge, Janet	State of Georgia Department of Environmental Resources
Butler, Craig	Louisville Metro Air Pollution Control District
Downs, Tom	Maine Department of Environmental Protection
Gering, John	State of Iowa Department of Environmental Resources
Hains, Jennifer	State of Maryland Department of the Environment
Heindorf, Mary Ann	State of Michigan Department of Environmental Quality
Hinson, Diana	State of Oklahoma Department of Environmental Quality
Holland, John C.	State of North Carolina Department of Environment and Natural Resources
Johnson, Andrew	Maine Department of Environmental Protection
Jones, Bryan	Louisville Metro Air Pollution Control District
Kwong, Jenette	California Air Resource Board
Lazor, Nick	State of Pennsylvania Department of Environmental Protection
Ollison, Will	American Petroleum Institute
Parker, Stuart	Inside Washington Publishers
Ridgway, Jennifer	San Joaquin Valley Air Pollution Control District
Steger, Joette	State of North Carolina Department of Environment and Natural Resources
Wilson, Linda M.	New York State Office of the Attorney General